Cleaning, Sterilization and Disinfection in Healthcare Facilities

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Cleaning, Sterilization and Disinfection

Invasive Procedures

- Medical device
- Surgical instrument

Cleaning, Sterilization and Disinfection

Level of disinfection or sterilization depends on intended use of the item

Spaulding classification scheme

- Categories based on degree of risk of infection

Spaulding Classification

Critical

- Items that contact sterile tissue or the vascular system
  - Surgical instruments
  - Cardiac and urinary catheters
  - Ultrasound probes used in sterile body cavities

Spaulding Classification

Critical

Destroys all microorganisms including bacterial spores

- Purchase sterilized
- Sterilized by steam sterilization
- If heat sensitive
  - Ethylene oxide (ETO)
  - Hydrogen peroxide gas plasma
  - Other liquid sterilants

Spaulding Classification

Semicritical

Items that contact mucous membranes or non-intact skin

- Respiratory therapy and anesthesia equipment
- Some endoscopes
- Laryngoscope blades
- Esophageal manometry probes
- Diaphragm fitting rings

Spaulding Classification

Semicritical

Destroys all microorganisms except high number of bacterial spores

- Require high-level disinfection (HLD)
  - Chemical disinfectants
    - Glutaraldehyde
    - Hydrogen peroxide
    - Ortho-phathalaldehyde (OPA)
    - Peracetic acid with hydrogen peroxide
    - Chlorine

Spaulding Classification

- Semicritical
  - HLD chemical disinfectants must have Food and Drug Administration (FDA) approval
  - Check chemical compatibility with items (manufacturers recommendation)
  - For respiratory or GI tract:
    - Rinse with water (sterile preferred)
    - Rinse with alcohol
    - Forced-air drying
    - Dry and store in a manner that protects them

Spaulding Classification

Semicritical

- Pasteurization
  - Heat automated HLD
  - Respiratory therapy equipment

Spaulding Classification

- Noncritical
- Items that contact intact skin
  - Bedpans
  - Blood Pressure cuffs
  - Crutches
  - Bed rails
  - Linens
  - Bedside tables

Spaulding Classification

Noncritical

- Intermediate-level disinfection
  - Destroys vegetative bacteria, mycobacteria, most viruses, most fungi but not bacterial spores
  - Use EPA- registered hospital disinfectant with label claim regarding tuberculocidal activity

Cleaning

- Items must be cleaned using water with detergents or enzymatic cleaners before processing (sterilization and HLD)
- Cleaning reduces the bioburden and removes foreign material that can interfere with processing

Cleaning

- Follow manufacturers' recommendations for manual cleaning (if needed), for dilution, temperature water hardness, and use (e.g. designed for use in in washers/decontaminators, ultrasonic cleaners).

Spaulding Classification

Noncritical

- Low-level disinfection
  - Destroys vegetative, some fungi and viruses but not mycobacteria or spores
  - EPA-registered hospital disinfectant with no tuberculocidal claim

Sterilization

Parameters monitored routinely:

- Mechanical: daily assessment of cycle time and temperature (computer printout , pressure gauges)
- Chemical: item has been exposed to the sterilization process (affix indicator to outside and inside pack)

Sterilization

- Biological:
  - *B atrophaeus* for ETO and dry heat
  - *G stearothermophilus* for steam, hydrogen peroxide gas plasma, and liquid peracetic acid
  - Perform biological testing weekly and with each load of containing implantables

Sterilization

- Air removal test (Bowie-Dick) on prevacuum steam sterilizers daily

Sterilization

	121C	132C	Drying time
Gravity displacement			
– Wrapped instruments	30 min	15 min	**15-30 min**
– Textile packs	30 min	25 min	**15 min**
– Wrapped utensils	30 min	15 min	**15-30 min**
Dynamic-air-removal (e.g., prevacuum)			
– Wrapped instruments		4 min	**20-30 min**
– Textile packs		4 min	**5-20 min**
– Wrapped utensils		4 min	20 min

The Joint Commission (TJC)

Steam sterilization position update 06/16/09

Surveyors will review critical steps of the disinfection and sterilization process

- Cleaning and decontamination
- Sterilization :meet mechanical, chemical and biologic parameters
- Storage or return to the sterile field

TJC

Surveyors will, among other activities:

- Observe instruments from the time they leave one operating room to when they are returned to the next.
- Ask health care workers to provide the manufacturers' instructions for instrument sterilization, and to describe and demonstrate how instruments are being cleaned and decontaminated according to those written instructions.
- Observe the cleaning of instruments. Rinsing is rarely enough to properly remove soil from instruments; meticulous cleaning is needed.

TJC

Surveyors will, among other activities:

- Verify that staff members are wearing appropriate personal protective equipment.
- Observe the sterilization process. The surveyor will ask for the manufacturer's instructions for the following items: the sterilizer, wrapping or packing, and the instruments.
- Review sterilization logs. Surveyors will ask about parametric, chemical and biological indicators.
- Observe the return of instruments to the sterile field and verify that they are being protected from recontamination.

High-Level Disinfection of Endoscopes

- Leak test with each reprocessing
- Meticulously clean with enzymatic cleaner
- Disconnect and disassemble endoscope components
- Flush and brush all accessible channels

High-Level Disinfection of Endoscopes

- Discard enzymatic cleaner after each use
- Use FDA-cleared sterilant or high level disinfectant
- Follow FDA-cleared label claim and manufacturers' recommended exposure conditions
- Select a disinfectant that is compatible with device being reprocessed

High-Level Disinfection of Endoscopes

- Completely immerse endoscope in HL disinfectant and ensure all channels are perfused. Follow manufacturers' recommendations
- Rinse endoscopes with water followed by a 70%-90% ethyl or isopropyl alcohol
- Use forced air to purge channels. Hang in a vertical position to facilitate drying

High-Level Disinfection of Endoscopes

- Maintain a log for each procedure: pat name , MR#, procedure date, endoscopist, system used to reprocess the endoscope, and serial # or other of the endoscope used
- Check disinfectant daily with a chemical indicator and document results of this testing
- Discard solution if indicator shows less than minimum effective concentration or if disinfectant is beyond re-use life recommended by the manufacturer

High-Level Disinfection of Endoscopes

- Provide HCW with device specific reprocessing instructions. Require competency testing on a regular basis
- Make PPE available and use to protect HCW form chemical and environmental exposures
- Automatic endoscopes reprocessor (AER) following manufacturer's instructions to ensure exposure of internal surfaces to disinfectant

Questions